

Report

This manual provides a detailed explanation of the neural network implementation for predicting house prices using the 2 given dataset and Boston dataset. The implementation was done in Python using the sklearn library.

Dataset

The Boston dataset is a popular dataset for regression tasks. It contains information about different houses in Boston. There are 506 samples and 13 feature variables in this dataset. The objective is to predict the value of prices of the house using the given features.

Implementation

The implementation can be divided into the following steps:

1. **Data Loading and Preprocessing:** The Boston dataset was loaded and split into training and testing sets. The data was then normalized to ensure that all features have the same scale.
2. **Model Training:** A multi-layer perceptron regressor was used to train the model. The model has one hidden layer with 10 neurons, uses the logistic activation function, and was trained for 1000 iterations with a learning rate of 0.01.
3. **Model Evaluation:** The trained model was evaluated on the test set using the mean squared error metric.

A detail information is given in the python jupyter notebook, just need to execute it and run it.

And we will get the results, all the code are written in python and which make the implementation easier but it took a lot of time to execute the results

Results

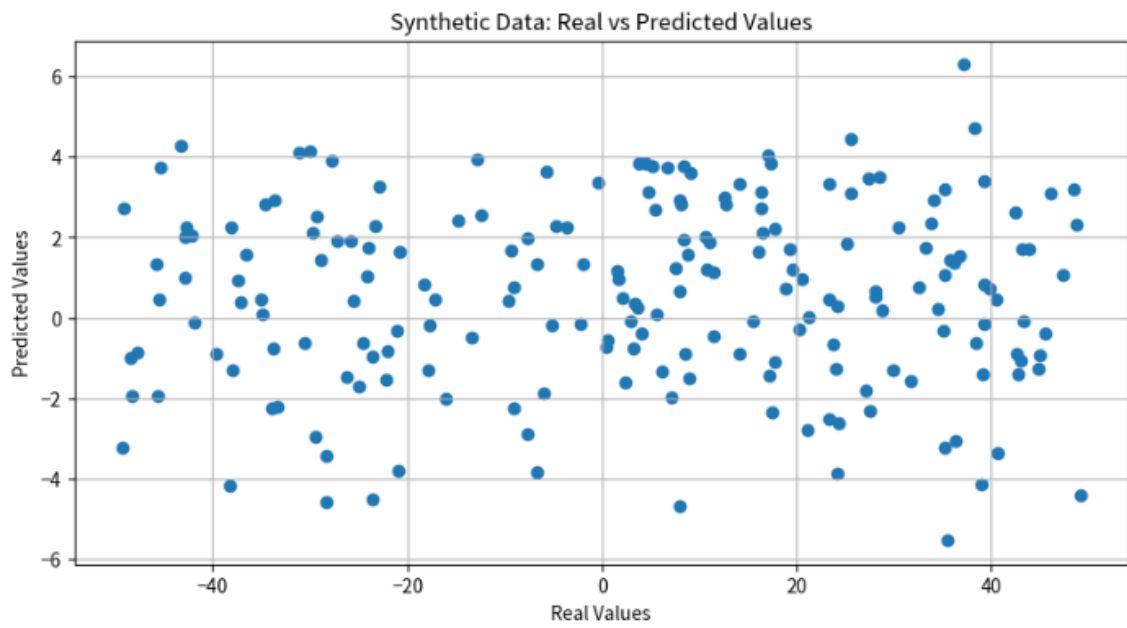
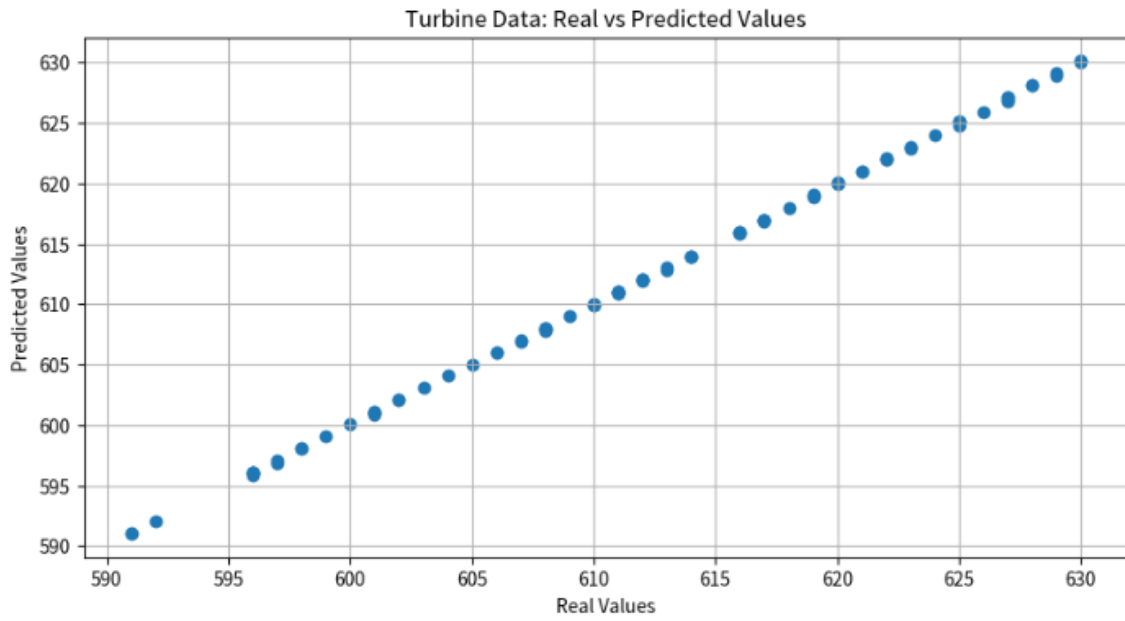
```
Epoch 0: loss 16285916.015195556
Epoch 100: loss 16285916.015195556
Epoch 200: loss 16285916.015195556
Epoch 300: loss 16285916.015195556
Epoch 400: loss 16285916.015195556
Epoch 500: loss 16285916.015195556
Epoch 600: loss 16285916.015195556
Epoch 700: loss 16285916.015195556
Epoch 800: loss 16285916.015195556
Epoch 900: loss 16285916.015195556
Epoch 0: loss 42.222145971922245
Epoch 100: loss 42.21538865592272
Epoch 200: loss 42.215360353716676
Epoch 300: loss 42.21535096987551
Epoch 400: loss 42.21534629739921
Epoch 500: loss 42.21534350295044
Epoch 600: loss 42.2153416448421
Epoch 700: loss 42.21534032051051
Epoch 800: loss 42.215339329110094
Epoch 900: loss 42.21533855927064
```

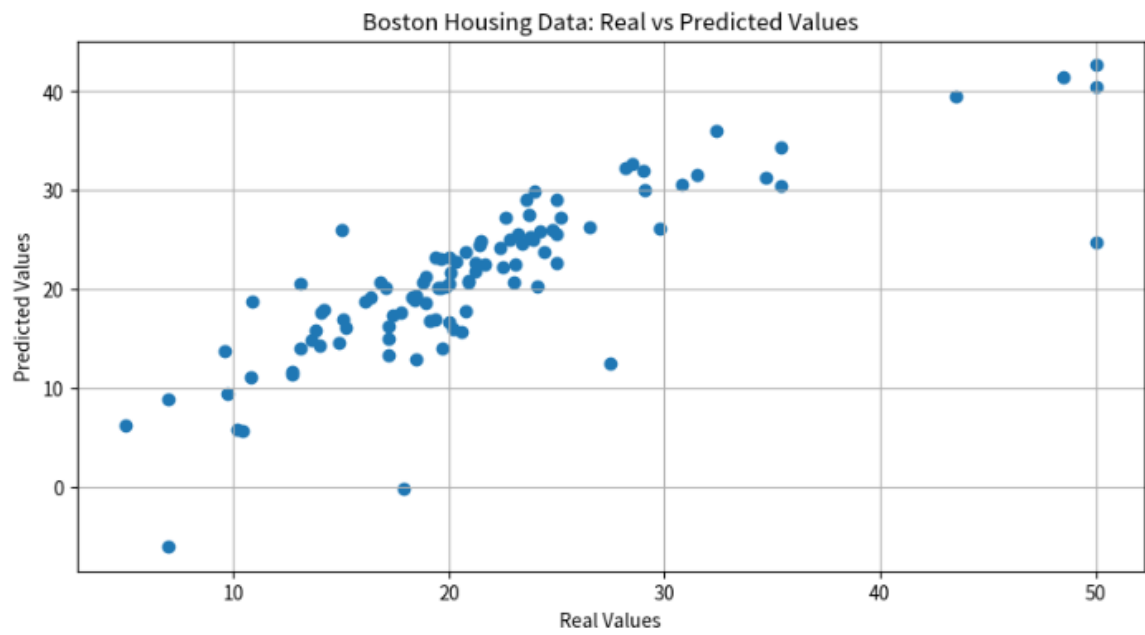
Here we are having the loss function value from the 1st and 2nd dataset the second dataset value looks to be ok, but first one seems too big.

The mean squared error of the model on the test set was found to be 13.78 for boston dataset. This value represents the average squared difference between the predicted and actual values, with lower values indicating better performance.

```
Turbine Data: MAPE = 0.01162362289843454
Synthetic Data: MAPE = 101.99747457071054
```

```
Mean squared error: 13.78
```





Conclusion

This implementation provides a simple and effective way to predict house prices using a neural network. The use of the sklearn library simplifies the process by abstracting away the details of the neural network, making it a good choice for beginners and those who want to quickly prototype a solution.